Platinum-Group Metals Statistics and Information

(Platinum, Palladium, Rhodium, Ruthenium, Osmium, and Iridium)

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Naturally occurring platinum and platinum-rich alloys have been known for a long time. The Spaniards named the metal " platina, " or little silver, when they first encountered it in Colombia. They regarded platinum as an unwanted impurity in the silver they were mining.

The catalytic properties of the six platinum group metals (PGM)– iridium, osmium, palladium, platinum, rhodium, and ruthenium – are outstanding. Platinum's wear and tarnish resistance characteristics are well suited for making fine jewelry. Other distinctive properties include resistance to chemical attack, excellent high-temperature characteristics, and stable electrical properties. All these properties have been exploited for industrial applications. Platinum, platinum alloys, and iridium are used as crucible materials for the growth of single crystals, especially oxides. The chemical industry uses a significant amount of either platinum or a platinum-rhodium alloy catalyst in the form of gauze to catalyze the partial oxidation of ammonia to yield nitric oxide, which is the raw material for fertilizers, explosives, and nitric acid. In recent years, a number of PGM have become important as catalysts in synthetic organic chemistry. Ruthenium dioxide is used as coatings on dimensionally stable titanium anodes used in the production of chlorine and caustic. Platinum supported catalysts are used in the refining of crude oil, reforming, and other processes used in the production of high-octane gasoline and aromatic compounds for the petrochemical industry. Since 1979, the automotive industry has emerged as the principal consumer of PGM. Palladium, platinum, and rhodium have been used as oxidation catalyst in catalytic converters to treat automobile exhaust emissions. A wide range of PGM alloy compositions is used in low-voltage and low-energy contacts, thick- and thin-film circuits, thermocouples and furnace components, and electrodes.

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